REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 40 to 67 and 76 are under active examination.

Election/Restrictions

1-3. Applicant herewith affirms the previous election to prosecute invention I, namely claims 41-67. Claims 67-74 have therefore been cancelled. Applicant intends to pursue the cancelled claims in a divisional application.

4. No amendment of inventorship is required as a result of the cancellation herewith of the claims to the non-elected invention.

Priority

5. The Examiner has acknowledged Applicant's claim for foreign priority, but has noted that no certified copy of the priority application GB 0406993.6 has been filed. It is pointed out in response that the US PTO's public online file wrapper indicates that the certified copy of this application is present on the official file (*see* entry dated 27 September 2006). Receipt was also acknowledged in the Notice of Acceptance letter (last item, page 1) dated October 19, 2007.

Claim Rejections under 35 USC § 112

6-8. In response to the rejection of claim 48, Applicants confirm that the term "incorporated into the solid polymer by dissolution or dispersion" means that the materials are incorporated into the solid polymer by being dispersed in the solid polymer or dissolved in the solid polymer. Furthermore, Applicant submits that this claim does particularly point out and distinctly claim the subject-matter at issue.

In this regard, it is set out on page 13, lines 22 to 25 of the description that "additional materials including chemicals, catalysts or enzymes may be incorporated into the treatment fluid by dissolution or dispersion" and that "such materials may additionally or instead be incorporated into the solid polymer by dissolution, dispersion or encapsulation by any method known to those skilled in the art".

Applicant submits that it would be obvious to those skilled in the relevant art that "incorporation" within the meaning of the present invention will typically be by dispersion (as set out in claim 48) or encapsulation (as set out in claim 47). However, in certain cases the skilled person would appreciate that dissolution in the polymer may also be possible and desirable. This could occur, for example, in the case of water-insoluble materials that are however soluble in the solid polymer.

It will be appreciated that the process of the present invention can involve the incorporation of a large number of different types of material into the solid polymer. The skilled person would appreciate that the broad wording "dissolution, dispersion or encapsulation" is intentionally used to cover all possible means by which these materials might be incorporated into the polymer. Of course, the particular method to be used will

depend on the particular material to be incorporated. Once a particular type of material has been chosen, however, methods for incorporation into the solid polymer are routine. This would be entirely clear to the relevant skilled person.

Still further, the present invention gives a specific example of salts being incorporated into the solid polymer (page 14, lines 7 to 10). It would be immediately apparent to one skilled in the art that incorporation of salt crystals into a polymer melt is a simple method of adjusting the density of the material to a desired value. In such a case, the salt crystals will most likely be present purely as a dispersion of salt crystals embedded in a matrix of solid polymer.

It is therefore submitted by Applicant that the skilled person would readily understand the meaning of these terms and how to best incorporate the various commonly used additive materials into a solid polymer. Accordingly, it is submitted that the rejection under this heading should be withdrawn.

Claim Rejections under 35 USC § 102

9&10. The Examiner has rejected claims 41-51 and 59-64 as being unpatentable over Willberg *et al.*.

In response, it is noted that Willberg *et al.* relates to compositions and methods for generating self-destructing filter cakes in wellbores and in subterranean formations (column 1, lines 11 to 13). The composition comprises a mixture of a "solid acid-precursor" and a "solid acid-reactive material" (column 1, line 64 to column 2, line 7). This mixture is capable of forming a filter cake for use in oilfield applications. The solid

acid-precursor then hydrolyses in the presence of water to produce an acid, which dissolves the acid-reactive material to destroy ("self destruct") some or all of the filter cake.

Accordingly, the composition of Willberg *et al.* is itself a filter cake. The purpose of this filter cake is clearly described at column 1, lines 18 to 29. In particular, it becomes clear that the filter cake is desirable in certain operations, for example to prevent fluid leakage during a well treatment, but then after that treatment becomes "undesirable or unacceptable". Thus, the filter cake provided by Willberg *et al.* is designed, as described above, to self-destruct over time.

It will therefore be appreciated that the "solid acid-precursor" of Willberg *et al.* is present in a completely different context from the solid polymer of the present invention. In particular, the "solid acid-precursor" of Willberg *et al.* is present as a solid mixture with an acid-reactive material, which is capable of creating a filter cake. In contrast, the solid polymer in the present invention is incorporated into a treatment fluid, which is capable of disrupting a filter cake.

Furthermore, the composition as defined in Willberg *et al.*, for example in claim 1, would not be suitable for exogenously disrupting a pre-existing filter cake in an underground formation, which is the object of the process claimed in the present application. The reason is that the acid produced by hydrolysis of the "solid acid-precursor" according to Willberg *et al.* is spent on the "solid acid-reactive material" (i.e., the other essential feature of the invention) as it is produced. The composition consequently self-destructs, but does not substantially disrupt a filter-cake other than the composition itself. In this respect, the acid according to Willberg *et al.* acts as an internal breaker; this contrasts

with the treatment fluids used in the process of the present invention, which act as exogenous breakers.

The claimed subject-matter is therefore not anticipated by Willberg *et al.*. It is accordingly submitted that the rejections under this heading should be withdrawn.

Claim Rejections under 35 USC § 103

12. Applicant confirms that the subject-matter of the claims on file at the time the inventions covered in them was commonly owned by the named joint inventors.

13. The Examiner has rejected claims 52-58 and 65-67 on grounds of obviousness, in particular as being unpatentable over Willberg *et al.* as applied to claim 41 above and further in view of Harris *et al.*.

In response, Applicant submits that the subject-matter of independent claim 41, which has in the foregoing paragraphs 9&10 been established to be novel over Willberg *et al.*, is also non-obvious over Willberg *et al.* in view of Harris *et al.*.

With reference to independent claim 41, Willberg *et al.* provides no suggestion at all of a process for disrupting filter cake in an underground formation. Rather, it outlines a process for forming or adding a filter cake, which then self-destructs *in situ*. Still less does Willberg *et al.* suggest a process that involves incorporating a solid polymer of the present invention into a treatment fluid, which is capable of exogenously disrupting a filter cake present in an underground formation. The skilled person would not therefore consider this document to be relevant to the task of providing a process for exogenously

disrupting a filter cake using a treatment fluid.

Harris *et al.* fails to remedy the deficiencies in the teaching of Willberg *et al.*. Like Willberg *et al.*, the document does not suggest the process defined in claim 41. In particular, Harris *et al.* teaches a method for treating an underground reservoir by introducing a treatment liquid comprising an ester and a non-enzyme catalyst capable of increasing the rate of hydrolysis of the ester. Hydrolysis of this ester produces an organic acid to dissolve acid soluble material present within the reservoir. The esters disclosed in Harris *et al.* are liquids (see, for example, the specific esters listed on page 4, lines 17 to 23 and in claim 11) and there is no suggestion at all that solid polymers could be used to replace these liquid esters. In addition, Harris *et al.* teaches that the specific combination of a liquid carboxylic acid ester such as a methanoic or ethanoic acid ester and a non-enzyme catalyst is necessary in order to achieve acid production at a sufficiently high rate to disrupt a filter cake. It is therefore surprising in view of Harris *et al.* that simply by adding a solid polymer of the invention to a treatment fluid one can arrive at a process that successfully disrupts a filter cake in an underground formation.

In view of the above, it will be clear that neither Willberg *et al.* nor Harris *et al.* suggests a process for exogenously disrupting filter cake with a solid polymer incorporated into a treatment fluid. The skilled person would not therefore have been able to derive the process of claim 41 from Willberg *et al.* and Harris *et al.*, either alone or in combination. Applicant therefore submits that the subject-matter of claim 41 is non-obvious over these documents.

Dependent claims 52-58 and 65-67 depend on claim 41 and therefore derive their patentability from it. Accordingly, Applicant submits that the subject-matter of these

claims must also be non-obvious over Willberg *et al.* in view of Harris *et al.*. It is therefore believed that the rejection over this combination of documents can be withdrawn.

14. The Examiner has further rejected claim 67 as being unpatentable over Willberg *et al.* as applied to claim 41 above and in view of Constien *et al.*.

In response, Applicant submits that the subject-matter of claim 41 is non-obvious over Willberg *et al.* in view of Constien *et al.*. The discussion in the foregoing paragraph 13 establishes that the claimed subject-matter is non-obvious over Willberg *et al.*.

Like Harris *et al.*, also discussed in paragraph 13, Constien *et al.* fails to remedy the deficiencies in the teaching of Willberg *et al.*. Constien *et al.* does not disclose or suggest the process defined in claim 41. In particular, Constien *et al.* teaches protective screen coatings comprising a binder which contains a reactive material. The reactive material can be any of a very wide range of materials, including enzymes, chelants, acids, surfactants, oxidisers or free radical generators, corrosion inhibitors, scale or paraffin inhibitors or "other specific chemicals as called for by a particular well condition" (column 6, lines 39 to 43). After placement of the screen, the binder dissolves or melts and thus releases the active material. There is no reference in Constien *et al.* to use of a treatment fluid of any sort, and still less of such a fluid in which a solid polymer has been incorporated. Thus, Constien *et al.* indicates that a solid polymer, if it is to be used at all, should be incorporated into a binder forming a solid coating on a screen.

In view of the above it will be clear that neither Willberg *et al.* nor Constien *et al.*. suggests a process for exogenously disrupting filter cake with a solid polymer

incorporated into a treatment fluid. The skilled person would not therefore have been able to derive the process of claim 41 from a combination of the teaching of Willberg *et al.* with that of Constien *et al.*. Applicant therefore submits that the subject-matter of claim 41 is non-obvious over these documents.

Claim 67 depends on claim 41 and thus derives its patentability from that claim. Accordingly, for the reasons discussed above in relation to claim 41, Applicant submits that the subject-matter of claim 67 is also non-obvious over Willberg *et al.* and Constien *et al.*. It is therefore believed that the rejection over this combination of documents can be withdrawn.

Favorable reconsideration and withdrawal of the outstanding objections and rejections is believed to be in order and is respectfully requested.

Please note the Information Disclosure Statement filed concurrently with this response.

Respectfully submitted,

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